

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of all claims in the application.

Claims 1-20 (Canceled)

21. (Previously presented) A microfluidic device comprising:

- (i) a first microchannel comprising a plurality of spatially distinct regions upon which a member of a specific binding pair is immobilized;
- (ii) at least a first entrance port and at least a first exit port for the transportation of at least one test sample;
- (iii) a fluid propelling component that controls that flow rate of said test sample;
- and
- (iv) a recirculating arm for recirculating said test sample across a spatially distinct regions.

22. (Previously presented) A microfluidic device according to Claim 21, wherein said first microchannel is serpentine.

23. (Previously presented) A microfluidic device according to Claim 21, further comprising at least one valve in said exit port.

24. (Previously presented) A microfluidic device according to Claim 21, wherein said first microchannel branches into multiple second microfluidic channels each of which comprises a plurality of spatially distinct regions upon which a member of a specific binding pair is immobilized.

25. **(Previously presented)** A microfluidic device according to Claim 21 or 24, wherein said device is fabricated from a material selected from the group consisting of silicon, silicon dioxide, glass, plastic and ceramic.
26. **(Previously presented)** A microfluidic device according to Claim 21, where in said spatially distinct regions comprise porous polymers.
27. **(Previously presented)** A microfluidic device according to Claim 21, wherein each of said spatially distinct regions has a different member of a specific binding pair immobilized thereto.
28. **(Previously presented)** A microfluidic device according to Claim 26, wherein said porous polymer is a a hydrogel pad.
29. **(Previously presented)** A microfluidic device according to Claim 28, wherein said hydrogel pad is a patterned gel pad further comprising spatially separated portions within said hydrogel pad.
30. **(Previously presented)** A microfluidic device according to Claim 1, wherein said spatially distinct regions in said microchannel comprise beads with said member of said specific binding pair immobilized thereto.
31. **(Previously presented)** A microfluidic device according to Claim 21, wherein said spatially distinct regions comprise microstructures fabricated into said microchannel.
32. **(Previously presented)** A microfluidic device according to Claim 21, wherein said microstructures comprise a series of columns molded into said first microchannel.
33. **(Previously presented)** A microfluidic device according to Claim 21, wherein said microstructures comprise domes molded into said first microchannel.

34. **(Previously presented)** A microfluidic device according to Claim 21, wherein said specific binding pair members are nucleic acids.

35. **(Previously presented)** A microfluidic device according to Claim 34, wherein said nucleic acid is a DNA.

36. **(Previously presented)** A microfluidic device according to Claim 34, wherein said nucleic acid is a RNA.

37. **(Previously presented)** A microfluidic device according to Claim 21, wherein said specific binding pair members are proteins.

38. **(Previously presented)** A microfluidic device according to Claim 37, wherein the proteins for one member of said specific binding pair are antigens.

39. **(Previously presented)** A microfluidic device according to Claim 37, wherein the proteins for one member of said specific binding pair are antibodies.

40. **(Previously presented)** A microfluidic device according to Claim 21, wherein said fluid propelling component comprises a pressurized gas, a vacuum, an electrical field, a magnetic field or a centrifugal force.

41. **(Currently amended)** A method of detecting a specific binding member in a test sample, said method comprising passing said test sample through the microfluidic device described in Claims 21, 22 or 24 to form a binding pair and detecting said binding pair.

42. **(Previously presented)** A method according to Claim 41, wherein said test sample is recirculated.

43. **(Previously presented)** A method according to Claim 41, wherein the flow rate of said test sample is adjusted using a fluid propelling component to increase contact between said binding pairs.

44. **(Previously presented)** A method according to Claim 41, wherein said fluid propelling component comprises a pressurized gas, a vacuum, an electrical field, a magnetic field or a centrifugal force.